1

2 Joseph M. Alioto (SBN 42680)
Theresa D. Moore (SBN 99978)

3 Jamie Miller (SBN 271452)
ALIOTO LAW FIRM

4 One Sansome Street, Suite 3500
San Francisco, CA 94104

5 Telephone: (415) 434-8900
Facsimile: (415) 434-9200

6 Email: jmiller@aliotolaw.com
Email: tmoore@aliotolaw.com

7

8 Lingel H. Winters, Esq. (State Bar No. 37759)
LAW OFFICES OF LINGEL H. WINTERS

9 A Professional Corporation
388 Market Street, Suite 1300

10 San Francisco, California 94111
Tel: (415) 398-2941

11 Fax: (415) 393-9887
Email: sawmill2@aol.com

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13 Attorneys for Plaintiffs
And All Others Similarly Situated

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16   UNITED STATES DISTRICT COURT

17   SOUTHERN DISTRICT OF NEW YORK

18

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20 JOHN NYPL, et al.   Case No.: 15 Civ. 9300 (LGS)
                        Plaintiffs,
21   **SUPPLEMENTAL REPORT AND**
          v.   **DECLARATION OF CARL S. SABA IN**
22   **SUPPORT OF MOTION FOR CLASS**
   JP MORGAN CHASE & CO., et al.   **CERTIFICATION**
23   Defendants.

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SUPPLEMENTAL CARL S. SABA DECLARATION IN SUPPORT OF MOTION FOR CLASS CERTIFICATION

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I, Carl S. Saba, declare as follows:

2   1.   I am a partner in the Forensic and Financial Consulting Services Group at Hemming

3   Morse, LLP, certified public accountants, and have been engaged by Plaintiffs' counsel as a

4   consultant in connection with the above-captioned case. I make this Declaration in support of

5   Plaintiffs' Motion for Class Certification. Except as otherwise stated, this Declaration is based on

6   my personal knowledge and, if called upon to do so, I could and would testify competently to the

7   facts stated herein.

8   2.   My employer Hemming Morse, LLP ("HM") is being compensated at an hourly rate

9   of $535 for my time, and at hourly rates ranging from $230 to $440 for employees who assisted me

10   on this assignment.

11   3.   This report summarizes my current opinion given the information available to me to

12   date; I may consider any additional materials that become available and amend or supplement my

13   opinions and this report, if appropriate.

14

Introduction and Qualifications

16   4.   I am a Certified Valuation Analyst (CVA) and have been a member of the National

17   Association of Certified Valuators and Analysts since June 2007. I am also an Accredited Senior

18   Appraiser (ASA) in businesses and intangible assets with the American Society of Appraisers, and

19   Accredited in Business Valuation (ABV) with the American Institute of Certified Public

20   Accountants. Among my professional activities, I am a Co-founder and Chair of the Executive

21   Committee of the Fair Value Forum. I am also a past Board Member and President of the Valuation

22   Roundtable of San Francisco. A current version of my curriculum vitae is attached to this

23   declaration as Exhibit C.

24   5.   I have testified as an expert on economic damages, valuation, and financial analyses

25   in 26 depositions, and 12 trials and arbitrations. I have also been retained in many other litigation

26   matters in which I provided an expert report or declaration that did not result in oral testimony. My

27   prior experience includes expert work in anti-trust litigation matters, and my valuation expertise

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includes work related to the traded public markets for equity and debt securities, derivatives, and digital currencies.

Analysis

6.   I have reviewed the plea agreements that Defendants have entered into where they pled that they "engaged in a conspiracy to fix, stabilize, maintain, increase or decrease the price of, and rig bids and offers for, the EUR/USD currency pair exchanged in the foreign exchange ("FX") Spot Market, by agreeing to eliminate competition in the purchase and sale of the EUR/USD currency pair"[1]. I have also reviewed Exhibits B-1 to D-3 of the Third Amended Complaint.

7.   In their participation "in the conspiracy from at least as early as December 2007 and continuing until at least January 2013"[2], Defendants manipulated the FX Spot Market exchange rates for the EUR/USD currency pair, including the currency "fixes" which are the FX Spot Market exchange rates at a certain time of day[3].

8.   The Third Amended Complaint, as revised by the Court, alleges that Plaintiffs in the Nypl v. JP Morgan putative class are defined as:

> *All consumers and businesses in the United States who directly purchased supracompetitive*
>
> *foreign currency at Benchmark exchange rates from Defendants and their co-conspirators*
>
> *for their own end use at least since January 1, 2007 to [December 31, 2013].*

9.   Interrogatory 8A in the Plaintiff's First Set of Interrogatories served on Defendants states "How did you a, a Defendant bank, determine the USD/EUR FX Exchange rate for purchase of EUR with USD for wire to another location in the period January 1, 2007 to January 2013. (A.)

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[1] JPMC plea agreement TAC Exhibit A-1 at ¶4(g), the Citicorp plea agreement TAC Exhibit A-2 at ¶4(g), the Barclays plea agreement TAC Exhibit A-3 at ¶4(g), the Royal Bank of Scotland plea agreement TAC Exhibit A-4 at ¶4(g).

[2] Defendants' plea agreements cite differing time periods that overlap December 2007 through January 2013. JPMC plea agreement TAC Exhibit A-1 at ¶4(g), the Citicorp plea agreement TAC Exhibit A-2 at ¶4(g), the Barclays plea agreement TAC Exhibit A-3 at ¶4(g), the Royal Bank of Scotland plea agreement TAC Exhibit A-4 at ¶4(g).

[3] Such fix rates are published "by accumulating quote and trade data within a set time interval around the fixing time" As an example "the mid-price between the median bid and median offer trades [during this time interval] yields the WM/R 4 pm fix". *Foreign exchange market microstructure and the WM/Reuters 4 pm fix.* P.S. Michelberger, J.H. Witte. January 14, 2016. Pages 27-28.

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AMENDED CARL S. SABA DECLARATION IN SUPPORT OF MOTION FOR CLASS CERTIFICATION

Was it based on a formula? (B.) Was it based on the spot rate as of a certain day, plus a markup?"[4].

In response, to the above interrogatory, Defendants served Responses including four declarations

which I have reviewed ("Defendants' June Declarations"):

    a.   Declaration of David C. Drago at JPMorgan Chase Bank, N.A. ("JPMorgan") as of June 19, 2020.

    b.   Declaration of Bohdan Kunyk at Bank of America, N.A. ("BofA") as of June 17, 2020.

    c.   Declaration of Jo-Anne E. Rivet at Bank of America, N.A. as of June 19, 2020.

    d.   Declaration of Terry Keller at Travelex Currency Services Inc. ("Travelex") as of June 17, 2020.

10.   According to their declarations, ▮▮ ▮▮▮▮▮▮▮▮ My review of Terry Keller's deposition transcript confirms this, Mr. Keller is asked ▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮ ▮▮▮▮ Mr. Keller responds ▮▮▮▮▮

11.   My research, including Defendants' June Declarations, has indicated that

transactions that involve the purchase of Euros with US Dollars by consumers and businesses

("End-users") from Defendant banks are priced based on ▮▮

12.   The Defendants' June Declarations indicate that Defendants priced their U.S.

customers' purchases of foreign currency based on a common formula in which the End-user

exchange rate was indexed to the FX Spot Market exchange rate. Defendants' June Declarations

describe ▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮

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[4] Plaintiffs' First Interrogatories to Defendants, February 7, 2020, Page 5, Lines 7-10.

[5] Deposition of Terry Keller, August 4, 2020, Page 87, lines 4-9. In this exchange, "arithmetic" refers to the manner in which Travelex calculated the price for retail customers to purchase foreign currency banknotes from Citibank. Mr. Keller's June 17, 2020 declaration also discusses Travelex providing similar outsource provider services to HBUS.

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██

███ . Defendants' June Declarations state

that ██

██

███ . This formula was

commonly applied for customer purchases processed by Defendants BofA, Citibank, N.A. ("Citi")

and HSBC Bank USA, N.A. ("HBUS"). In addition, declarant Drago of JPMC sets forth what

seems to be the same common formula, ██████████████████████████████████

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█████████████████████████████████████ [9]

13.   The ███████████████████████████████████████

█████████████████████████ , which Defendants admitted to manipulating in their plea

agreements. As such, ███

██

Therefore, any manipulation of the FX Spot Market price by Defendants directly impacted End-user

prices paid by End-user class members.

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[6] Declaration of Bohdan Kunyk, June 17, 2020, Paragraph 5. Declaration of Jo-Anne E. Rivet, June 19, 2020, Paragraph 5. Declaration of Terry Keller, June 17, 2020, Paragraphs 8 & 14.

[7] Declaration of Jo-Anne E. Rivet, June 19, 2020, Paragraph 5. Declaration of Terry Keller, June 17, 2020, Paragraphs 9 & 15.

[8] Declaration of David C. Drago, June 19, 2020, Paragraphs 4-8. JPMC-NYPL-0001041956. Mr. Drago states that ██
██████ The Declarations of Jo-Anne Rivet and Bohdan Kunyk both indicate ████████
██

[9] Declaration of Bohdan Kunyk, June 17, 2020, Paragraphs 4-5.

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14.   In order to further confirm that there is a direct relationship between the exchange rate charged to End-user class members and the FX Spot Market exchange rates, I analyzed purchases of Euros paid for in US Dollars. This included Euro to Dollar exchange rates offered by Bank of America, Citibank, and JP Morgan Chase in FX purchases made on specific days in 2017 ("TAC Transactions"), that are alleged in the Third Amended Complaint ("TAC") and included in Exhibits E-1 and F of the TAC. In addition, Plaintiff Valarie Jolly testified to purchases of Euros with US Dollars from JP Morgan Chase Bank, N.A. ("JP Morgan Chase") for transactions occurring between 2008 and 2013 ("Jolly Transactions")[10].

15.   After receiving Defendants' June Declarations, I compared the exchange rates offered by JP Morgan Chase, which represent the rates that are charged to End-users, to the FX Spot Market Rates[11] on the same days. For each day relevant to the TAC Transactions and Plaintiff Jolly Transactions, I calculated the average of the close of the FX Spot Market Rates at 6:00, 7:00 and 8:00 am Eastern Time. These reflect the timeframe per the Defendants' June Declarations, at which Defendants set End User Bank Rates on a given day using the FX Spot Market Rates (between 6 and 7 am ET, or 7 and 8 am ET). As the FX Spot Market Rate data was maintained in Greenwich Mean Time ("GMT"), this is equivalent to selecting the spot rates as of 10:00 am, 11:00 am and 12:00 pm GMT, to account for the 4 hour difference between GMT and Eastern Daylight Time ("EDT"). These calculations and analyses are shown in Exhibit A-1 and B-1 to this Declaration.

16.   As discussed in paragraphs 9-11 above, End-user rates offered by Defendants on the TAC Transactions and Jolly Transactions were based on ████████████████████████ ███████████ In order to determine whether the FX Spot Market Rate is closely correlated to the End-user rates offered by Defendants on the TAC Transactions and Jolly Transactions, I applied a simple linear regression to the two rates in both data sets.

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[10] Deposition of Valarie Jolly, December 18, 2019, Exhibit 6, 000969-000987

[11] As reported by the Dukascopy Swiss Banking Group historical data feed. Dukascopy provides historical bid and ask exchange rate data down to the tick, second, minute, hour, day, week and month for a variety of financial instruments, including currencies.
https://www.dukascopy.com/swiss/english/marketwatch/historical/

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17.   The linear regression equation applied a formula by which the FX Spot Market Rate is used as an explanatory variable ("X") to predict the End-user rate as a dependent variable ("Y"). I applied this regression to the above data of transactions occurring between March 28, 2017 and April 13, 2017 for the TAC Transactions, and between August 27, 2008 to October 7, 2013 for the Jolly Transactions. I excluded from the TAC Transactions data set Citibank and Bank of America transactions, as there were only two of each, and to exclude any possible differences in handling fees between banks. However, the Citibank and Bank of America withdrawal slips are set forth in TAC Exhibit E-1, and they reflect purchases of foreign currency accomplished by debiting the purchaser's bank account.

Results of Regression of TAC Transactions Data Set

18.   The results of the regression analysis for the TAC Transactions are shown in Exhibit A to this report, and indicate a strong fit between the End-user bank rate and the rate predicted by the regression formula as applied to the FX Spot Market Rate. This result is very similar to the regression analysis that I performed for the TAC Transactions in my April 29, 2020 Declaration and my May 3, 2017 Declaration that is attached as Exhibit F to the TAC. The only difference is that I am using the FX Spot Market Rate rather than the ECB Fix Rate as the independent variable. The results and conclusions drawn from this analysis are similar to those discussed in the TAC. Just as there is a strong fit between the ECB Fix Rate and the End-user rates in the TAC Transactions, there is also a strong fit between the FX Spot Market Rate and the End-user rates in the TAC Transactions. The End-user rate charged for Euro to Dollar exchange by JP Morgan Chase in the TAC Transactions can be predicted with **99.83%** or better accuracy by applying the regression formula to the FX Spot Market Rate

Results of Regression of Jolly Transactions Data Set

19.   For the Jolly Transactions, the resulting regression equation from the JP Morgan Chase Euro to Dollar transactions was as follows:

$$Y = 0.9872X + 0.0555$$

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20.   The output of this regression analysis is shown in Exhibit B. I reviewed the output of the regression analysis and noted that the R-squared was 99.2%. In the case of the Jolly Transactions between August 27, 2008 and October 7, 2013, the R-squared of over 99% indicates a strong fit between the data and the regression line. Below is a chart comparing the actual End-user rate as observed on the Jolly Transactions, as compared to the predicted End-user rate based on application of the regression formula to the FX Spot Market Rate:

Financial Institution	Transaction Date	FX Spot Market Rate	End User Bank Rate	Regression Predicted End User Bank Rate	% Difference Between Actual and Regression Predicted End User Rate
JPM Chase	8/27/2008	1.4745	1.5088	1.5112	-0.1556%
JPM Chase	9/26/2011	1.3501	1.3925	1.3884	0.2988%
JPM Chase	9/27/2011	1.3568	1.3925	1.3949	-0.1716%
JPM Chase	3/21/2012	1.3239	1.3601	1.3624	-0.1691%
JPM Chase	3/26/2012	1.3265	1.3725	1.3651	0.5449%
JPM Chase	10/2/2012	1.2922	1.3276	1.3312	-0.2705%
JPM Chase	5/1/2013	1.3214	1.3532	1.3599	-0.4960%
JPM Chase	9/17/2013	1.3358	1.3751	1.3742	0.0668%
JPM Chase	10/7/2013	1.3571	1.4001	1.3952	0.3507%

21.   In the above nine transactions, the End-user rate charged for Euro to Dollar exchange by JP Morgan Chase can be predicted with **99.45%** or better accuracy by applying the regression formula to the FX Spot Market Rate. As noted in the far-right column, no variance between the predicted rate and the actual rate exceeds 0.55%. A visual representation of the fit between the predicted and actual end user rates is appended to this report as Exhibit B.

22.   Additional evidence of a strong fit of the data to the regression line is contained in the F Probability, which is 0.000001508%. As the, the F Probability is well below 1%, this indicates evidence of predictive power.

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Summary of Findings

23.   My review of the limited transaction data provided to me indicates that the FX Spot Market Rate appears to be strongly correlated with and an accurate predictor of the End-user rates charged by JP Morgan Chase in the TAC Transactions as well as the Jolly Transactions. My analysis demonstrates that there is the same strong fit and correlation between the FX Spot Market Rates that Defendants used and the End-user rates in the Plaintiff Jolly Transactions as there is between the ECB Fix Rate and the End-user rate in the TAC Transactions, and the End-user rates can be predicted with more than 99% accuracy in both sets. The FX Spot Market Rate and the End-user rate appear to move in tandem up and down, in a formulaic manner as predicted by the regression equation, irrespective of which type of transactions are entered into by End-users for purchase of Euros with US Dollars. This result provides preliminary confirmation of my research and finding that ███ ███████████████████████████ as noted in Defendants' June Declarations.

Methodology for Estimating Damages to Class Members

24.   I have reviewed Defendants' Responses And Objections to Plaintiffs' Fourth Set Of Interrogatories served on July 27, 2020 by Barclays, Citibank, JPMC, RBS and UBS. Defendants' Responses including Appendices set forth a common methodology for calculating the loss to victims, including market share and overcharges, utilized by the U.S. Department of Justice as a basis for assessing fines imposed on Defendants.

25.   I will estimate damages incurred by End-users in the class who purchased Euros at supracompetitive exchange rates from Defendants using a common formula similar to that applied by the U.S. Department of Justice, with adaptation to transactions relevant to the class defined in the Third Amended Complaint. The common formula for calculating damages is *the retail exchange rate overcharge in the sale of foreign currency by Defendants to End-users times the volume of affected retail commerce*. It is noted that this approach is intended to quantify aggregate damages to class members

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AMENDED CARL S. SABA DECLARATION IN SUPPORT OF MOTION FOR CLASS CERTIFICATION

26.   The first variable in the common formula, *the retail exchange rate overcharge* but-for Defendants' conspiracy to manipulate the FX Spot Market Rate, will be either 0.0003 (three percentage in points or "pips") as determined by the U.S. Department of Justice,[12] or my estimate of the effect of the conspiracy on the spread of the EUR / USD exchange rate in the FX Spot Market during the conspiracy period (2007 – 2013), with an apportionment of this spread between purchase and sale transactions (bid and offer transactions for EUR/USD). This impact on the spread can be estimated using several methods, including but not limited to comparing spreads for the FX Spot Market bid and offer prices during the conspiracy period (2007 – 2013) to the spreads before and after the conspiracy period, and analysis of the change in FX Spot Market spread in the period immediately following the conspiracy period, i.e., when the manipulation ceased.

27.   The second variable in the common formula, *the volume of affected retail commerce* will involve assessing the aggregate market share of Defendants in relevant class transactions.

I declare under penalty of perjury that the foregoing is true and correct.

Executed this 23rd Day in November 2020 at Los Altos, California.

CARL S. SABA, MBA, CVA, ASA, ABV

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[12] Citi's Responses and Objections to Plaintiffs' Fourth Set of Interrogatories, July 27, 2020, Page 11. Barclay's Responses and Objections to Plaintiffs' Fourth Set of Interrogatories, July 27, 2020, Appendix A-2. JPMC Sentencing Memo, December 1, 2016, Pages 6-7. Barclays Sentencing Memo, December 1, 2016, Pages 6-7. Citi Sentencing Memo, December 1, 2016, Pages 6-7.

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